2010 Report to the Blake Fund Committee

Project Overview:

Myles Standish State Forest (MSSF) and adjacent natural areas comprise one of the three largest remaining Pitch Pine *(Pinus rigida)*/Scrub Oak *(Quercus ilicifolia)* ecosystems in the world, providing essential habitat to many species of rare and threatened plants, invertebrates and vertebrates. In particular, MSSF provides core breeding habitat for three bird species which are rapidly declining in New England - Prairie Warbler *(Dendroica discolor)*, Common Yellowthroat *(Geothlypis trichas)* and Eastern Towhee *(Pipilo erythropthalmus)* - as well as for many other vulnerable animals and plants such as the well known Whip-poor-will *(Caprimulgus vociferous)*, Barrens Buck Moth *Hemileuca maia)* and Broom Crowberry *(Corema conradii).*

Fire is intrinsic to the maintenance of Pine Barrens' ecology, as evidenced by charcoal deposits in MSSF pond cores dating back to the post-glacial period. Fire restores the shrub and herb layers and is important for maintenance of the fire-adapted Pitch Pine tree layer. However, due to the growth of nearby suburban housing developments starting in the 1970's and 1980's, fires have been suppressed over the past 40 years. This has significantly impacted the habitats of MSSF. The forest's tree composition is changing, canopies are expanding and the shrub and herb layers are diminished - all signaling the decline of the Pine Barrens' natural systems.

In the last three years, MSSF, The Nature Conservancy and the fire departments of the surrounding towns have tested a program of controlled burns aimed at restoring natural fire-adapted ecology in MSSF, while keeping nearby neighborhoods protected. This collaboration will continue and expand to larger tracts throughout MSSF in the coming years.

This expanded controlled burn program offers excellent opportunities to support threatened bird populations through the design and timing of the proposed burns. Based on extensive bird and habitat research conducted by Manomet in MSSF in the 1970's and 80's, there is good information on the optimal habitat types, stages of succession and plot configurations needed to support each of the key species.

Therefore, the goals of this two-year project are to

1) Determine the current breeding status of threatened bird species in MSSF, by habitat type, density and location, compared with Manomet's previously collected MSSF data as well as other regional and national avian databases;

2) Maximize the benefits of the controlled burning program to bird species within MSSF by making recommendations on size/shape, habitat mix and timing of the burns to benefit key bird species;

3) Work with MSSF, The Nature Conservancy (TNC), the Friends of Myles Standish SF and Mass Audubon's IBA program to incorporate the results of this study into educational materials and outreach, to promote understanding of the benefits of controlled burning to neighboring towns, as well as to natural history groups and other organizations. This group has already presented public programs in the towns of Plymouth and Carver, with Wareham scheduled this fall.

2010 Activities:

1. A series of 10 sample plots, circles of 50m radius, were surveyed along some of the most mature Pitch Pine/Scrub Oak habitat in the SE corner of Myles Standish SF. These plots sampled over one kilometer of mature forest (approximately 60-70 years since burning) between East Line Road and the main power transmission lines. These replicated the sample locations used in a Manomet study of this area in 1982.

2. The ten circles were sampled during 4-5 hour census visits in late June and July. Visits were timed to occur just after dawn when territorial song was at its peak.

3. During early August 2010 25x25 m plots were laid out from each point and vegetation species, height, tree DBH, density and % cover were recorded.

4. On an ongoing basis, census data from Manomet's 1974-1982 bird distribution and vegetation data were combined and analysis was started. This activity will continue through 2011.

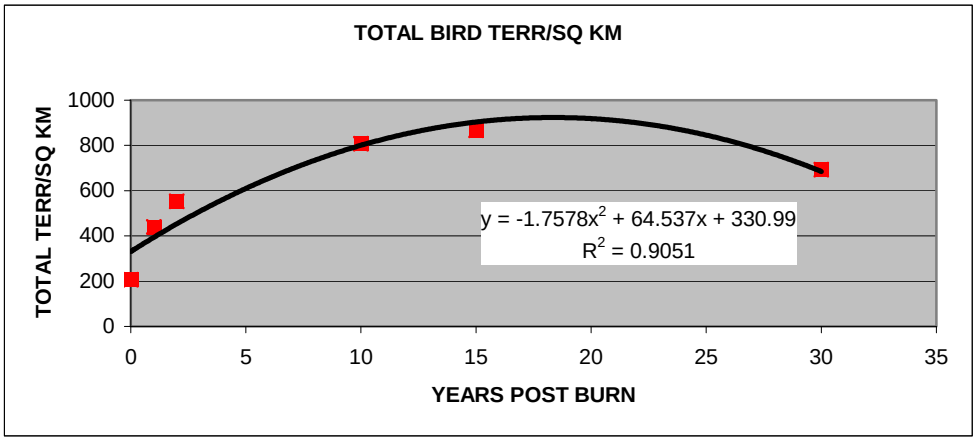
5. These data were also presented at the Friends of Myles Standish SF workshop (10th Oct. 2010) and will be incorporated into the Resource Management Plan for the forest which will be finalized in 2011 by the Department of Conservation and Recreation. The conservation biology goal is to establish the use of controlled burning throughout the Pitch Pine/Scrub Oak habitat. Apart from the improvement of the habitat for the key bird, invertebrate and plant species breeding in MSSF, the controlled burns will greatly reduce fire hazard to the surrounding property owners.

6. Nocturnal Whip-poor-will surveys were completed on two 10-mile transects through and near the MSSF.

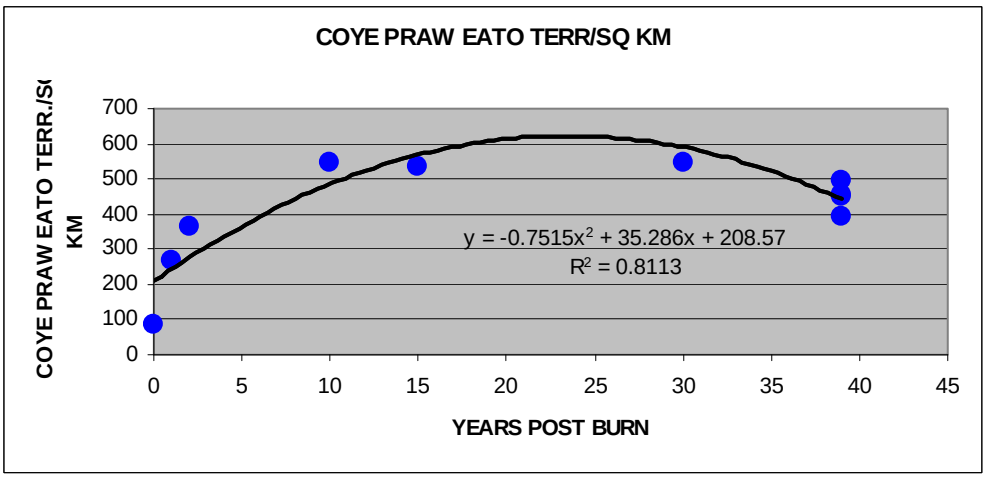
7. Through the Friends of MSSF, a co-operative working partnership has been established between:
Myles Standish State Forest staff
Massachusetts Audubon Society IBA program
The Nature Conservancy
Manomet Center for Conservation Sciences
Members of the local public and active birders in the region.

Provisional 2010 Results:

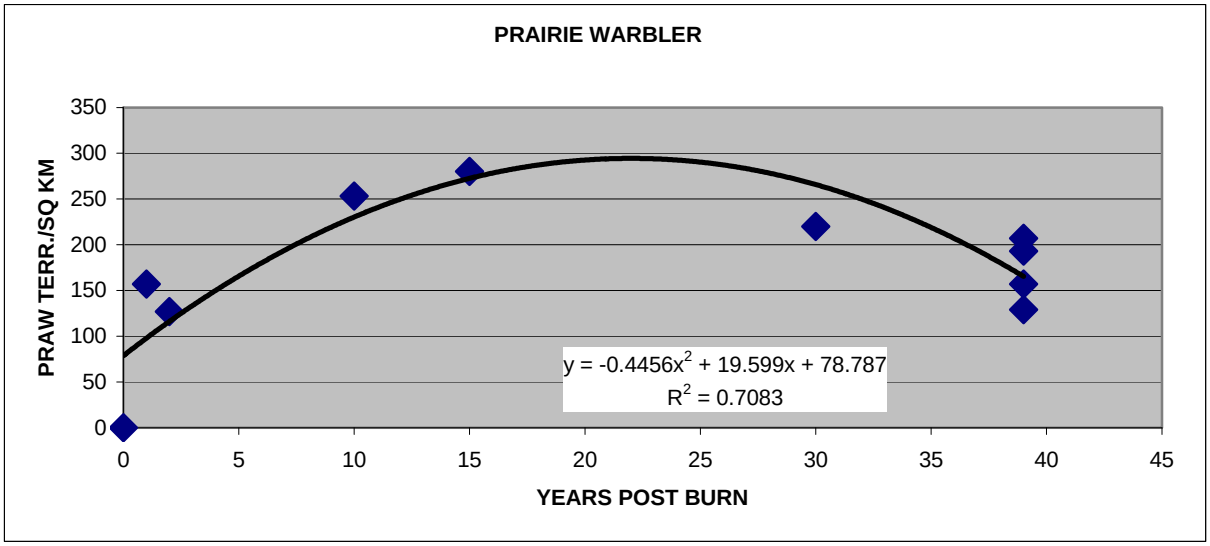
Because much of the analysis will be incomplete until after next season's fieldwork in 2011, I will present here four working graphs that summarize our knowledge of bird density in MSSF for the first 40 years after burning of the individual plots:



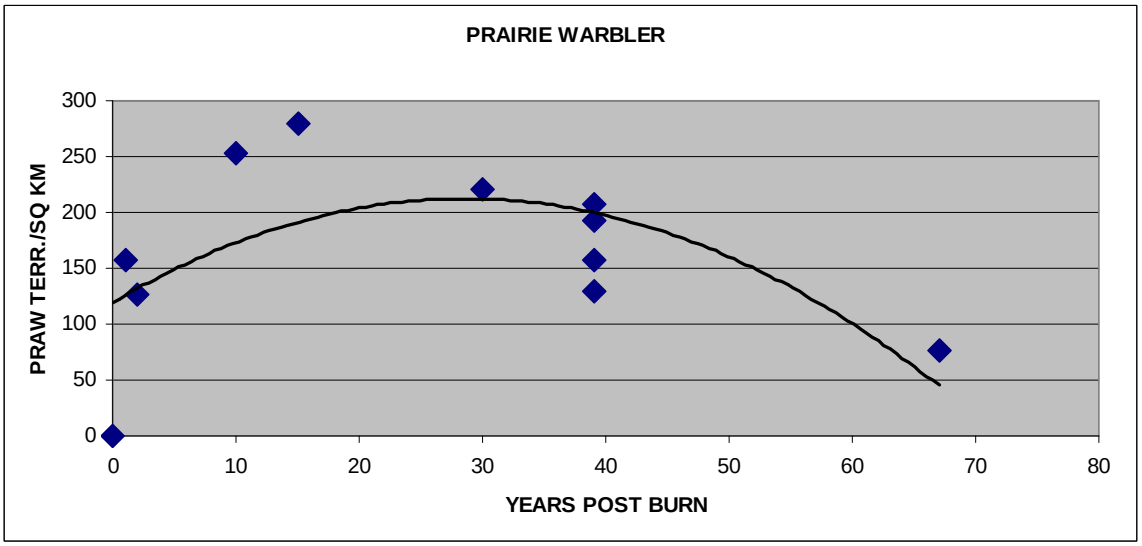
Peak density of all bird species occurs between approximately 10-25 years post burn.



Common Yellowthroat (COYE), Prairie Warbler (PRAW) and Common Yellowthroat (COYE) territories combined represent between 65% and 85% of all birds on the plots. Peak density of these three species occurs between 15-30 years post burn.



Prairie Warblers show a marked drop-off in density after a peak of ca. 20-25 years post burn. The 2010 density (not shown here) for a ca. 67 year post fire plot (all 2010 data combined) was only 76 territorial males per km².



The provisional graph above incorporates 2010 PRAW densities and may indicate a serious decline in breeding density. This also correlates with an increase in density, height and canopy cover of White Pines (not a fire resistant species), an increase in density of breeding Pine Warblers, general increase in tree canopy cover and a general decrease in shrub and herb cover.

Common Yellowthroat density appears to remain high in the 2010 census (ca. 67 years post burn) while Eastern Towhee density may have increased, but a second year of data will clarify these trends. It is always possible that changes in density of a particular

species may be ecologically linked with concomitant increases in other species. The increase in White Pines should be controllable by fire.

2011 fieldwork will document bird and vegetation data from an adjacent section of forest which was lightly burned in a controlled fire in 2009/2010. By working closely with the partners listed above, we will hope to refine and inform the regime of controlled fire management already under way.

The results and conclusions presented above are provisional and may change in light of next season's fieldwork and further detailed analysis.

Respectfully submitted,

Trevor L. Lloyd-Evans.